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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/027,020

12/21/2001

Joydeep sen Sarma

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10/20/2006

CESARI AND MCKENNA, LLP  
88 BLACK FALCON AVENUE  
BOSTON, MA 02210

EXAMINER

DALENCOURT, YVES

ART UNIT

PAPER NUMBER

2157

DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/027,020

Applicant(s)

SARMA ET AL.

Examiner

Yves Dalencourt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 28-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 16-25 is/are allowed.
- 6) ☒ Claim(s) 1-15 and 28-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This office action is responsive to Request for Continued Examination (RCE) filed on 07/21/2006.

#### ***Priority***

The status of Related Applications mentioned on page 1 of the specification needs to be updated.

#### ***Response to Amendment***

The Examiner has acknowledged the amended claims 1 – 21, the cancellation of claims 26 – 27, and the submission of new claims 28 – 34.

#### ***Response to Arguments***

Applicant's arguments filed on 07/21/2006, regarding claim 1, have been fully considered but they are not persuasive.

In response to the applicant's first argument, the Examiner directs applicant's attention to the operation of vgexport and vgimport. Contrary to what the applicant suggests (i.e., vgexport does not modify the ownership information on the disks), vgexport does modify the disks that are exported; it writes such information to the disks. See the example source code listing for vgexport, given in the document vgexport.c. The source code is part of an open-source logical volume manager library available for Linux and it explains what functions vgexport implements. The document is not relied upon as prior art, but as evidence in support of the view that vgexport writes "ownership" information to the disks. In the document vexport.c, see the static function vgexport single, which includes vg write(vg). The function vg write writes "ownership" information "vg" to the disks.

The logical volume manager (LVM) on Linux implements the representative functional capabilities of other UNIX flavors of LVM.

As for the applicant's second argument (i.e., Gross teaches away from the changing ownership information"), the Examiner notes that the applicant misinterprets the Grossman's statement "volume group information and data is untouched on the physical volume." What source code listing shows is that the volume group information and data are not modified, but the **ownership information** (e.g., See vg->status != EXPORTED\_VG in vgexport.c) is indeed modified.

### ***Claim Objections***

Claim 8 is objected to because of the following informalities: It is suggested to delete " sever " (line 14), and insert --- server ---. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 9, 10, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Gross et al (Pat. No. 6,128,734, Gross hereinafter)

With respect to claim 1, Gross shows a method *of transferring ownership of a volume comprising the steps of changing ownership information stored in each of the plurality of disks to an un-owned state from a state of source tile server ownership* [See vgexport command on lines 49-55, column 9]; *changing ownership information stored in each of the plurality of disks to a state of*

*destination file server ownership from the un-owned state* [See vgimport command on lines 4955, column 9].

With respect to claim 9, Gross shows a method of transferring ownership of a volume having a plurality of disks comprising the steps of writing a first log to record a first part of a transfer process; [The vgexport causes lvmtab to be rewritten. The first part of transfer process is therefore recorded in lvmtab. The file system is no longer within the system; therefore it is in "un-owned" state. See lines 55-60, column 9] performing the first part of the transfer process, the first part of the transfer process being changing ownership information stored on each disk of the volume from a source server to an un-owned state [The vgexport removes device files. The removal causes the system to no longer "own" the file system, as the file system no longer exists on the server. See lines 55-60, column 9]; writing a second log to record a second part of the transfer process [The vgimport causes /dev/volume-group to be written. File volume-group serves as a "log," which serves as a record of transactions. See lines 1-12 in column 10. Note that volume-group also serves as a configuration file]; and performing a second part of a transfer process, the second part of the transfer process being changing ownership information stored on each from the un-owned state to a destination server. [The vgimport cause lvmtab to be rewritten. The file system is imported, and is thus "owned" by the system. See lines 1-12, column 10].

Claims 10 and 13 incorporate all the limitations of claims 1 and 9, but in computer product form and apparatus form rather than in method form. The reasons for the rejections of claims 1 and 9 apply to claims 10 and 13. Therefore, claims 10 and 13 are rejected for substantially the same reasons.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 – 3, 11 – 12, and 14 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross et al (Pat. No. 6,128,734, Gross hereinafter) in view of Brunelle et al (US 6,654,902; hereinafter Brunelle).

With respect to claim 2, Gross shows *the step of changing ownership of the plurality of disks to an un-owned state further comprises the steps of changing a first ownership attribute of the disks to an un-owned state* [See lines 55-60, column 9. The vgexport removes /dev/volume\_group from /etc/lvmtab file]; and *changing a second ownership attribute of the disks to an un-owned state* [See lines 55-60, column 9. The vgexport removes the device files associated with /dev/volume\_goup from the system].

Gross teaches substantially all the limitations in claim 2, but fails to specifically that the first ownership attribute is a predetermined ownership sector on each disk; and the second ownership attribute is a small computer systems interface (SCSI) reservation.

However, Brunelle teaches an analogous persistent reservation IO barriers, which comprises a first ownership attribute that is a predetermined ownership sector on each disk (col. 5, lines 27 - 37); and a second ownership attribute is a small computer systems interface (SCSI) reservation (col. 5, lines 38 - 58).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gross by having a first ownership attribute that is a predetermined ownership sector on each disk; and a second ownership attribute is a small computer systems interface (SCSI) reservation as evidenced by Brunelle for the purpose of providing sharing a storage device amongst a plurality of computers while providing data integrity in the storage device.

With respect to claim 3, Gross shows *the step of changing ownership information stored in each of the disks to a destination file server further comprises the steps of changing a first ownership attribute of the disks to a destination tile server state* [See lines 1-12, column 10. The vgimport adds /dev/volume-group to /etc/lvmtab file]; and *changing a second ownership attribute of the disks to a destination file server state* [See lines 1-12, column 10. The vgimport adds the devices files associated with /dev/volume\_group to the system].

Gross teaches substantially all the limitations in claim 2, but fails to specifically that the first ownership attribute is a predetermined ownership sector on each disk; and the second ownership attribute is a small computer systems interface (SCSI) reservation.

However, Brunelle teaches an analogous persistent reservation IO barriers, which comprises a first ownership attribute that is a predetermined ownership sector on each disk (col. 5, lines 27 - 37);

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and a second ownership attribute is a small computer systems interface (SCSI) reservation (col. 5, lines 38 - 58).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gross by having a first ownership attribute that is a predetermined ownership sector on each disk; and a second ownership attribute is a small computer systems interface (SCSI) reservation as evidenced by Brunelle for the purpose of providing sharing a storage device amongst a plurality of computers while providing data integrity in the storage device.

Claims 11 – 12 and 14 - 15 incorporate all the limitations of claims 2 and 3, but in computer product form and apparatus form rather than in method form. The reasons for the rejections of claims 2 and 3 apply to claims 11 – 12 and 14 - 15. Therefore, claims 11 – 12 and 14 - 15 are rejected for substantially the same reasons.

Claims 4, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross in view of Matsunami et al (Pub No.: 2002/0099914, Matsunami hereinafter).

With respect to claim 4, Gross shows: *sending a first message to a source server, the message containing a request for transferring ownership of a volume of disks [ See lvremove command on lines 35-38, column 4. The command is in UNIX. Removing the group removes the ownership of the volume, because it removes the volume]; receiving a response from the source server [It is inherent in the execution of lvremove command to give a response, which would then be transmitted back to the client]; if the response contains abort information, aborting the transfer [If the command were unable to execute, lvremove has inherent capability of generating an error message, in which case any further steps for disk transfer cannot execute. The aborting capability (or sending an abort message) is inherent in lvmremove]. if not, verifying that the volume can be transferred [Each LVM commands has internal error checking. When a string of them is executed, the last one*



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serves as the step for "verifying." If any of the steps fails, the overall execution fails ("aborts")); *if the volume can be transferred, sending a second message to the source server to perform the first part of a transfer process to transfer ownership from the source server to an un-owned state* [vgremove can be used. vgremove is one of the commands inherent in LVM]; *receiving a response from the source server after it performed the first part of the transfer process* [the execution of LVM manager command, vgremove generates either error message or a successful return message. The feature is inherent in LVM.]; and in response to the step of receiving, performing a second part of a transfer process to transfer ownership from the un-owned state to a destination file server [vgcreate is one of the commands inherent in LVM].

Gross does not show each of the above steps in combination.

Matsunami, however, shows a network environment in which disk transfer maybe made from one server to another.

It would have been obvious to one of ordinary skill in the art at the time of the invention to remove a set of disks from one server and to reallocate it to another, because the reallocation allows one to reuse disks.

In addition, it also would have been obvious to one of ordinary skill in the art at the time of the invention to sequence the steps given above in order to move physical volumes from one server to another. Moving the disks *requires* the following steps (which are the summary of the steps in the claim) to be executed in proper sequence. (1) transmission and reception of commands from a client station (2) the removal of all LVs (vgremove will generate an error if there are any logical volume which exists on the volume group) (3) the removal of the volume group and physical volumes, and (4) recreation of volume groups, using the same physical volumes, in another server. They must all be executed; otherwise, volume transfer would not work.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use LVM commands (either inherent or otherwise) given in Gross with Matsunami's system, because, as it is shown in Fig. 11, LVM (item 252) is part of Matsunami's system. The Management Console (301) can generate (either via scripting or user input) proper LV commands to LVM on the server, to release the disks to be transferred, as explained for removing a volume and to install the disks on a different server.

With respect to claims 6 and 8, Matsunami shows steps of: *verifying that the disks can be transferred in response to an initial request from a destination server* [The management console is opened at a server, as it can be at any terminal. See Fig. 7 for forming disk pool that can be used. The execution of the management console would send the first message from the server]; *sending an acknowledgement by the source file server to the destination file server* [See paragraph 0071 The server name is entered to LUN forming program interface, which communicates to the destination server]; *receiving a second request from the destination file server* [See paragraph 0071. The server sends a response back];

*aborting if the second request contains abort information* [The paragraph 0078 speaks of preventing access conflict];

*changing the volume to an off-line status in response to the second request not containing abort information* [Removing a volume group from the source server (See the discussion of claim 5, in reference to part of limitation that reads on Gross) makes it "off-line." ]

*performing a first part of a transfer process, the first part of the transfer process being transferring ownership of the source file to an un-owned state* [See the discussion of claim 4 above in reference to part of the limitation that reads on Gross]; and

*sending a message to the destination file server to prompt a second part of the transfer process, the second part of the transfer process being transferring ownership from the un-owned*

*state to the destination server* [See 0095. Pool manager sends notice to the pool management agent. See the discussion of claim 4 for relevant part of the limitations that reads on Gross].

Claims 5, 7, and 28 - 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross in view of Matsunami et al (Pub No.: 2002/0099914, Matsunami hereinafter), and further in view of Brunelle et al (US 6,654,902; hereinafter Brunelle).

With respect to claims 5 and 7, Gross in combination with Matsunami teach substantially all the limitations in claims 4 and 6 including the limitations that are already incorporated in claims 2 and 3, but fail to specifically that the first ownership attribute is a predetermined ownership sector on each disk; and the second ownership attribute is a small computer systems interface (SCSI) reservation.

However, Brunelle teaches an analogous persistent reservation IO barriers, which comprises a first ownership attribute that is a predetermined ownership sector on each disk (col. 5, lines 27 - 37); and a second ownership attribute is a small computer systems interface (SCSI) reservation (col. 5, lines 38 - 58).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gross by having a first ownership attribute that is a predetermined ownership sector on each disk; and a second ownership attribute is a small computer systems interface (SCSI) reservation as evidenced by Brunelle for the purpose of providing sharing a storage device amongst a plurality of computers while providing data integrity in the storage device.

Claims 28 - 34 incorporate all the limitations of claims. The reasons for the rejections of claims 4 - 6 apply to claims 28 - 34. Therefore, claims 28 - 34 are rejected for substantially the same reasons.

#### ***Allowable Subject Matter***

Claims 16 – 25 are allowed.

### Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yves Dalencourt whose telephone number is (571) 272-3998. The examiner can normally be reached on M-TH 7:30AM - 6: 00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yves Dalencourt  
  
October 15, 2006  
YVES DALENCOURT  
PRIMARY EXAMINER  
TECHNOLOGY CENTER 2100